

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date  
4 November 2004 (04.11.2004)

PCT

(10) International Publication Number  
**WO 2004/095460 A2**

(51) International Patent Classification<sup>7</sup>:**G11C**

(21) International Application Number:

PCT/US2004/003773

(22) International Filing Date: 10 February 2004 (10.02.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/458,649 28 March 2003 (28.03.2003) US

(71) Applicant (for all designated States except US): GRASS VALLEY (U.S.) INC. [US/US]; 400 Providence Mine Road, Nevada City, California 95959 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): CASTLEBARY, Robert, Allen [US/US]; 10915 Peaceful Valley Road, Nevada City, California 95959 (US).

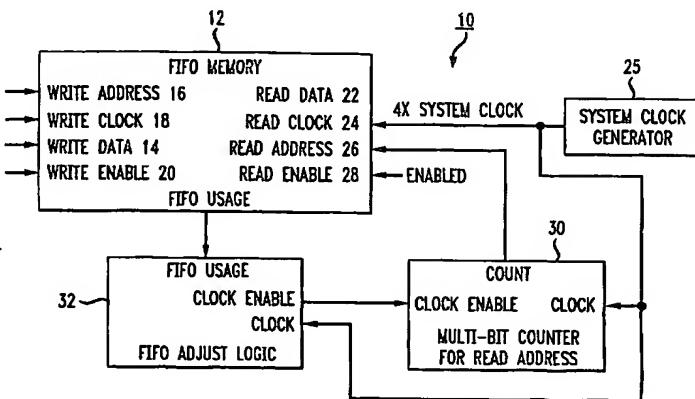
(74) Agents: TRIPOLI, Joseph, S. et al.; Two Independence Way, Suite #200, Princeton, New Jersey 08540 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK,

*[Continued on next page]*

(54) Title: ASYNCHRONOUS JITTER REDUCTION TECHNIQUE



```

If Fifo Usage = OK
    If FifoUsage = Empty or Almost Empty
        Start FifoAdjust Sequence & Repeat
    If Fifo Usage = Full or Almost Full
        Start FifoAdjustSequence & Drop
    If !FifoAdjustSequence
        Clock Enable every 4th clock cycle
    If FifoAdjustSequence & Drop
        Clock Enable after 3rd clock cycle
    If FifoAdjustSequence & Repeat
        Clock Enable after 5th clock cycle
Note FifoAdjustSequence drop 4 1/4samples
over a period of time.

```

(57) Abstract: The amount of jitter incurred when reading data written into a FIFO (12) can be reduced by clocking the FIFO with Read Clock pulses at a frequency  $x f_n$  where  $x$  is a whole integer and  $f_n$  is the frequency at which the memory is clocked to write data. Read Addresses are applied to the FIFO at a frequency on the order of  $f_n$  to identify successive locations in the memory for reading when the memory is clocked with read clocked pulses to enable reading of samples stored at such successive locations. The duration of at least one successive Read Addresses is altered in response to memory usage status to maintain memory capacity below a prescribed threshold.